

**WHAT IS CLAIMED IS:**

1. A component mounting apparatus having two board transfer devices each for transferring boards; component supply means for supplying plural kinds of components to be mounted on the boards; and a component placing device including component placing head means for picking up the components supplied from the component supply means to mount the picked-up components on the boards and head moving means for moving the component placing head means at least two directions parallel to a surface of the board, wherein the component placing device mounts the components simultaneously or alternately on two boards which have been transferred by the two board transfer devices to respective component mounting positions.

2. The apparatus of Claim 1, wherein the two board transfer devices comprises two conveyors of linear transfer type arranged in parallel relation with each other and wherein the component supply means includes two component supply devices each arranged at the outside of the board transfer device associated thereto.

3. The apparatus of Claim 1, wherein each of the board transfer devices is adjustable to alter the transfer way width thereof in a direction perpendicular to the transfer direction.

4. The apparatus of Claim 1 wherein the component placing head means comprises a single component placing head.

5. The apparatus of Claim 4, wherein a controller is provided for controlling the component placing head to mount the components picked up from the component supply means, on two boards alternately.

6. The apparatus of Claim 4, wherein a controller is provided for controlling the component placing head to mount the components picked up from the component supply means, on two boards alternately at different frequencies.

7. The apparatus of Claim 4, wherein a controller is provided for controlling

the component placing head to perform the component mountings intensively onto one of the two boards while the other board is being transferred after the completion of the component mountings thereon, or while the board transfer device for transferring the one board is being adjusted to alter the transfer way width thereof.

8. The apparatus of Claim 1 wherein the component placing head means comprises two component placing heads, and wherein the head moving means comprises two head moving mechanisms respectively for moving the two component placing heads independently of each other.

9. The apparatus of Claim 8, wherein a controller is provided for controlling one of the component placing heads to perform the component mountings mainly on one of the two boards and for controlling the other placing head to perform the component mountings mainly on the other board.

10. The apparatus of Claim 8, wherein a controller is provided for controlling the component mounting apparatus in such a way that while one of the two boards is being transferred after the completion of the component mountings thereon, or while the board transfer device for transferring the one board is being adjusted to alter the transfer way width thereof, one of the component placing heads for performing the component mountings mainly on the one board performs the component mountings on the other board to help the other placing head in performing the component mountings on the other board.

11. The apparatus of Claim 8, wherein the positions to which the two board transfer devices respectively transfer the two boards for component mountings thereon are different from each other.

12. The apparatus of Claim 8, wherein a controller is provided for controlling the component mounting apparatus in such a way that while one of the component placing heads is performing the component mountings on one of the two boards within a predetermined interference risk zone which is around a center

portion between the two boards, the other component placing head performs the component mountings on the other board within an interference-free zone which is outside the interference risk zone.

13. The apparatus of Claim 8, wherein a controller is provided for controlling the component mounting apparatus in such a way that while one of the two boards is being transferred after the completion of the component mountings thereon, or while the board transfer device for transferring the one board is being adjusted to alter the transfer way width thereof, the component placing heads are selectively advanced into a predetermined interference risk zone which is around a center portion between the two boards, to perform the component mountings on the other board.

14. The apparatus of Claim 8, wherein setting means is provided for setting one of the two board transfer devices as regular type product transfer device for transferring boards used for regular type products and the other board transfer device as brake-in product transfer device for transferring boards used for brake-in products which are different in width from the regular type products.

15. The apparatus of Claim 14, wherein the regular type products are changeable from the first-type regular products on which component mountings are being performed at the one board transfer device, to second-type products, the apparatus further comprising:

trial production means operable prior to such changing for effecting component mountings on the boards for the second-type products at the other board transfer device on a trial basis; and

setting change means for changing the setting means so that at the time of such changing, the other board transfer device is set as the regular type product transfer device for transferring boards used for regular type products, while the one board transfer device is set as brake-in product transfer device for transferring boards used for brake-in products which are different in width from the

regular type products.

16. The apparatus of Claim 1, wherein the products on which the component mountings are performed at the two board transfer devices are changeable from first-type products to second-type products, the apparatus further comprising:

trial mounting means operable when component mountings are performed on the boards for the first-type products at one of the two board transfer devices, for effecting component mountings on the boards for the second-type products at the other board transfer device on a trial basis; and

another trial mounting means for effecting component mountings on the boards for the second-type products at the one board transfer device after component mountings on a full-scale basis are started on the boards for the second-type products at the other transfer device.

17. A component mounting apparatus having two board transfer devices for respectively transferring boards in respective directions parallel to each other, each of the transfer devices being provided with two guide rails for guiding the both sides of each board; two component supply devices provided respectively at the outsides opposite to the center side where the two board transfer devices adjoin to each other; and a component placing device composed of a component placing head for picking up the components supplied from the component supply devices to mount the picked-up components on the boards and a head moving mechanism for moving the component placing head in at least two directions parallel to a surface of the board; wherein of the two guide rails of each board transfer device, an outside guide rail adjacent to a corresponding one of the two component supply devices is fixedly provided, while the other guide rail at the center side is provided adjustably in a direction perpendicular to the direction in which the other guide rail extends.

18. A component mounting apparatus having two board transfer devices

for respectively transferring boards in respective directions parallel to each other, each of the transfer devices being provided with two guide rails for guiding the both sides of each board; two component supply devices provided respectively at the outsides opposite to the center side where the two board transfer devices adjoin to each other; guide rail position adjusting means for adjusting the position of each of the guide rails in a direction perpendicular to the direction in which the guide rails extend; and a component placing device composed of a component placing head for picking up the components supplied from the component supply devices to mount the picked-up components on the boards and a head moving mechanism for moving the component placing head in at least two directions parallel to a surface of the board; wherein the guide rail position adjusting means positions each outside guide rail of each two guide rails adjacent to a corresponding one of the two component supply devices, to a position closest to the corresponding one of the two component supply devices and also positions each center side guide rail of each two guide rails in dependence on the width of the boards to be transferred along the two guide rails.

19. A program for controlling the operation of a component mounting apparatus having two board transfer devices for respectively transferring boards; at least one component supply device for supplying components of plural kinds to be mounted on the boards; and a component placing device composed of at least one component placing head for picking up the components supplied from the at least one component supply device to mount the picked-up components on the boards and head moving means corresponding in number to the at least one component placing head for moving the at least one component placing head in at least two directions parallel to a surface of the board; the program being designed to control the component mounting apparatus in such a way that the component placing device mounts the components simultaneously or alternately on two boards transferred by the two board transfer devices to respective component

mounting positions, and that while either one of the two board transfer devices is transferring the board on which component mountings have been completed, or while either one of the two board transfer devices is being adjusted to alter the transfer way width thereof, the at least one component placing head mounts the components intensively on the board at the other board transfer device.

20. A program for controlling the operation of a component mounting apparatus having two board transfer devices for respectively transferring boards; at least one component supply device for supplying components of plural kinds to be mounted on the boards; and a component placing device composed of two component placing heads for picking up the components supplied from the at least one component supply device to mount the picked-up components on the boards and two head moving mechanisms for respectively moving the two component placing heads each in at least two directions parallel to a surface of the board; the program being designed to control the component mounting apparatus in such a way that the component placing device mounts the components simultaneously or alternately on two boards transferred by the two board transfer devices to respective component mounting positions, and that while either one of the two component placing heads is mounting the components on either one of the two boards within a predetermined interference risk zone which is close to the center portion between the two boards, the other component placing head mounts the components on the other board at an interference-free zone except for the predetermined interference risk zone.

21. A program for controlling the operation of a component mounting apparatus having two board transfer devices for respectively transferring boards; a component supply device for supplying components of plural kinds to be mounted on the boards; a component placing device composed of a component placing head for picking up the components supplied from the component supply device to mount the picked-up components on the boards and a head moving

mechanism for moving the component placing head in at least two directions parallel to a surface of the board; setting means for setting one of the two board transfer devices as regular type product transfer device for primarily transferring boards for regular type products and the other board transfer device as brake-in product transfer device for primarily transferring boards for brake-in products which are different in width from the regular type products; and rail width adjusting means for adjusting the rail-to-rail width of each of the board transfer devices; th program being designed to control the component mounting apparatus in such a way that in response to a production command for the brake-in products of a certain type other than the regular type products, the other board transfer device is operated to unload the board for the regular type products therefrom while preventing another board for the regular type products from being loaded thereto, that a mounting program for controlling the mounting operations at the other board transfer device is changed to another mounting program corresponding to the brake-in products of the certain type, that the other board transfer device is adjusted to have a rail-to-rail width corresponding to the brake-in products of the certain type, and that boards for the brake-in products of the certain type are successively loaded to the other board transfer device to have components mounted thereon.

22. A program for controlling the operation of a component mounting apparatus having two board transfer devices for respectively transferring boards; a component supply device for supplying components of plural kinds to b mounted on the boards; a component placing device composed of a component placing head for picking up the components supplied from the component supply device to mount the picked-up components on the boards and a head moving mechanism for moving the component placing head in at least two directions parallel to a surface of the board; and setting means for setting one of the two board transfer devices as regular type product transfer device for primarily

transferring boards for regular type products and the other board transfer device as brake-in product transfer device for primarily transferring boards for brake-in products which are different in width from the regular type products; the program being designed to control the component mounting apparatus in such a way that when the regular type products are to be changed from first regular type products on which component mountings are being performed at one of the two board transfer devices, to second regular type products, component mountings on a trial basis are performed on the second regular type products at the other board transfer device prior to such changing, and that at the time of such changing, the setting of the setting means is altered to set the other board transfer device as the regular type product transfer device for primarily transferring boards for the regular type products and the one board transfer device as the brake-in product transfer device for primarily transferring boards for the brake-in products which are different in width from the regular type products.

23. A program for controlling the operation of a component mounting apparatus having two board transfer devices for respectively transferring boards; a component supply device for supplying components of plural kinds to be mounted on the boards; and a component placing device composed of a component placing head for picking up the components supplied from the component supply device to mount the picked-up components on the boards and a head moving mechanism for moving the component placing head in at least two directions parallel to a surface of the board; the program being designed to control the component mounting apparatus in such a way that when the type of products for which the component mountings are being performed at the two board transfer devices are to be changed from a first type to a second type, component mountings on a trial basis are performed on the boards for the second type products at the other of the two board transfer devices while component mountings are being performed on the boards for the first type products at one of



the two board transfer devices, and that after component mountings on a full-scale basis are started at the other board transfer device for the second type products, component mountings on the trial basis are performed at the one board transfer device for the second type products.

24. A program for controlling the operation of a component mounting apparatus having two board transfer devices for respectively transferring boards in respective directions parallel to each other, each of the transfer devices being provided with two guide rails for guiding the boards; two component supply devices provided respectively at the outsides opposite to the center side where the two board transfer devices adjoin to each other; guide rail position adjusting means for adjusting the position of each of the guide rails in a direction perpendicular to the direction in which the guide rails extend; and a component placing device composed of a component placing head for picking up the components supplied from the component supply devices to mount the picked-up components on the boards and a head moving mechanism for moving the component placing head in at least two directions parallel to a surface of the board; the program being designed to control the component mounting apparatus in such a way that the guide rail position adjusting means positions the outside guide rail of each two guide rails adjacent to a corresponding one of the two component supply devices, to a position closest to the corresponding one of the two component supply devices and also positions the center side guide rail of each two guide rails in dependence on the width of the boards to be transferred along each two guide rails.

25. A component mounting system using a component mounting apparatus which has two board transfer devices for respectively transferring boards; a component supply device for supplying components of plural kinds to be mounted on the boards; and a component placing device for picking up the components supplied from the component supply device to mount the picked-up components

on the boards; the system being operable in a first production mode wherein the component placing device mounts components on two boards which have been transferred by the two board transfer devices to respective component mounting positions or in a second production mode wherein one of the two board transfer devices is used as mounting conveyor where the component placing device mounts components on the boards, while the other board transfer device is used as bypass conveyor by which the boards unnecessary to have components mounted thereon are transferred to bypass the mounting operations at the one board transfer device.

26. A component mounting system using a component mounting apparatus which have two board transfer devices for respectively transferring boards; a component supply device for supplying components of plural kinds to be mounted on the boards; and a component placing device for picking up the components supplied from the component supply device to mount the picked-up components on the boards; the system being operable in a first production mode wherein the component placing device mounts components on two boards which have been transferred by the two board transfer devices to respective component mounting positions or in a second production mode wherein one of the two board transfer devices is used as mounting conveyor where the component placing device mounts components on the boards, while the other board transfer device is used as return conveyor by which the boards required to have components remounted thereon are returned to a loading side of the component mounting apparatus.

27. The component mounting system of Claim 26, further comprising:

a shifting device provided at the loading side of the component mounting apparatus for transferring the boards returned by the other board transfer device to the loading side, to the one board transfer device; and

another shifting device with an inspection station arranged at an unloading side of the component mounting apparatus, for inspecting the boards transferred

by the one board transfer device and for transferring each board which omits a component but is able to remount the same, to the other board transfer device.